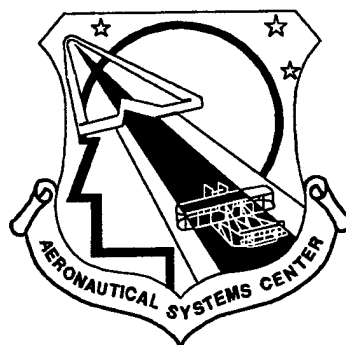


ASC-TR-96-5003

**TECHNICAL ATROPHY'S THREAT TO
LARGE ORGANIZATIONS**



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FINAL REPORT

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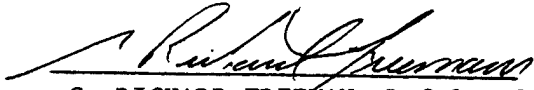
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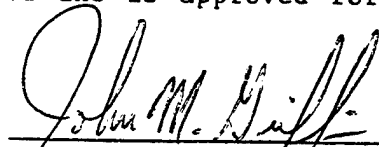
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13. ABSTRACT (Maximum 200 words) A literature search for studies on the subject of large companies and other large organizations that fail competitively after their staffs were downsized, frozen or otherwise incapacitated. A comparison between commercial and government organizations was made to determine applicability of information derived from the commercial sector. A model of a "typical" technical organization is presented and impacts of various downsizing methodologies are discussed. Companies that downsized only slightly, or not at all, significantly outperformed companies that significantly downsized.				
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TECHNICAL ATROPHY'S THREAT TO LARGE ORGANIZATIONS

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PREFACE

As members of the Aeronautical Systems Center, (ASC), Reserve organization, located at Wright-Patterson AFB in Dayton OH, the authors were approached by the Development Planning Directorate, Headquarters Aeronautical Systems Center (HQ ASC/XR) to evaluate the impacts of government downsizing on the technical responsiveness and ability of Air Force weapon system development personnel to adequately meet customer needs. The request was made in the form of proving or disproving a hypothesis. It was the team's objective to correlate research data gained from the commercial realm to that of the government. The particular focus was to relate the commercial results to ASC's new weapons system development organizations. The end objective of the effort was to provide information for management to correct potential technical atrophy at ASC.

The ASC Reserve unit referred to here, is a group of Individual Mobilization Augmentees (IMAs) who individually "contract" with active duty organizations to augment their ability to meet identified mission requirements. Each IMA brings to the task a unique blend of both former active duty and current civilian work experience, thereby making them ideally suited to perform this study. Under the overall leadership of Lt Col Freeman, team members were selected based upon their expertise in research methodologies, personal experience in executive management of complex technical organizations - both within and outside the government, civilian and government contracting, engineering, product development, and process development/improvement experience. Special thanks is given to Col Eric Stephens, Major Carolyn Speese and Capt Diana Angelis who assisted greatly with the initial research, concept formulation, and briefing development upon which this paper is founded.

Introduction

Over the last decade, many large organizations have been faced with the challenge of remaining competitive in shrinking markets. Budgets of both customers and internal organizations have dwindled, forcing management to take actions to remain profitable, and in some cases stay in business. Many organizations have chosen to downsize, "rightsize" or re-engineer, hoping this would keep the organization prosperous. More than 7 million workers have been laid off during the 8 year period 1987-1995.¹ "Firing people has gotten to be trendy in corporate America, in the same way that building new plants and being considered a good corporate citizen gave you bragging rights 25 years ago. Now you fire workers - especially white collar workers - to make your corporate bones."² Like the commercial sector, Department of Defense budgets have likewise dwindled. In order to meet the challenge of ever shrinking budgets the government has been downsizing.

The purpose of this paper is to examine lessons learned in the commercial sector and apply them to the technical sector within the Air Force, specifically ASC. Due to the lack of any information on the impact of downsizing technical/engineering within government organizations, research focused on corporate organizations in the commercial sector. Information gathered was then compared to government organizations and applied. This paper definitively confirms that significant arbitrary downsizing of technical organizations is not of long-term benefit to the organization. Through comparison of the industrial/commercial sector results to the government organization, this paper further recommends a method for preventing technical atrophy during the downsizing process.

The management of ASC and the project sponsor's office, (ASC/XR), suspected that significantly downsizing the military and civilian forces within product development centers had significantly impacted both short-term and long-term ability to respond to the weapons systems development needs and requirements of the Air Force user community. Further, that corrective actions were needed, however, the types and course of these actions was unknown. Unfortunately, the lack of empirical data prevented the organization from pursuing an appropriate course of corrective action. "We know we are failing to meet our customers needs with increasing regularity; however, we are unsure of the best course of action required to remedy this situation."³ This led the Development Planning Directorate to request assistance from the ASC Reserve organization to examine this issue.

The Hypothesis

Instead of developing a detailed work statement, the sponsor organization astutely developed a hypothesis which our team would seek to prove or disprove. The hypothesis was stated as:

Large organizations fail competitively after their technical staffs were significantly downsized, frozen, or otherwise incapacitated.ⁱ

In order to fully understand the hypothesis, several definitions of terminology used and implied in the hypothesis statement are necessary.

“Failing competitively” was deemed to mean falling behind competitors in new product introduction, loss of market share, and/or decreased profitability. You will recall that most available research has been conducted in the commercial marketplace, so measures such as these were used to define competitive success/failure.

Comparing Government to Industry

At the outset, questions arose as to whether it was valid to compare government and commercial industrial organizations. As a result of the team’s research and long discussions between members, several comparison challenges were distilled. These can be summarized as follows.

- 1) Measurement of a commercial company’s “success/failure” is primarily based upon profitability and market share. Since government organizations are not profit and loss centers, a direct comparison based on these criteria would be difficult at best.
- 2) The government’s strategic plans are heavily influenced by political factors. For example, Congress allocates and rescinds funding for product development, at times seemingly without regard to development lead time requirements or whether the military services deem the system necessary or not. On the other hand, commercial entities develop strategic plans which are primarily market and profit driven rather than founded in the “politics” of the nation.
- 3) Historically, the government is limited in its ability to abandon product lines. Until a system is completely decommissioned and removed from service, there is a need to maintain an organization which can keep the system fully operational.ⁱⁱ This can

ⁱ This paper in fact answers this hypothesis and takes it one step further through the provision of recommended actions. This paper also sets the framework for future discussions pertaining to “right-sizing”, and correct “shaping” of technical organizations.

ⁱⁱ Military weapons systems, unlike the vast majority of commercial products, if employed cannot fail, but rather must perform as intended the first time. Failure of any weapons system from the simplest gun to the most complex missile or aircraft system to operate properly when needed would result in catastrophic consequences.

entail redesigning an obsolete component, to stocking custom repair parts, long since abandoned by the commercial sector that initially supplied them. Conversely, corporations producing consumer products are able to phase out an obsolete product much more quickly than the military, and be more efficient and profitable as a result. Finally, phasing out a weapon system prior to having something to replace it leaves the government vulnerable in its mission to defend or preserve the peace.

While these issues identify some unique differences between government and industry, they do not completely preclude making comparisons related to the success of each type of organization. There are also traits which are common to both types of organizations, especially in the focused technical engineering arena. These common traits are what make direct comparison possible. In each type of organization, the following traits exist and are essential to organizational success.

- 1) Both need to continually research, develop, and field new "products" that outperform those presented by the competition to survive.
- 2) Each has the need for technical expertise above their "competitor."
- 3) Both need to continually "re-shape" their organizations to maximize efficiency.
- 4) Personnel seek individual stability and growth, and
- 5) Organizational focus must be on the total "value" added.

The team's conclusion is that government and industry technical engineering organizations can be compared based on their need to meet the common factors delineated above. From this, a methodology for performing the study was generated.

Methodology

The methodology developed for the study is fairly straightforward. First the team would gather as much data as they could pertaining to industrial downsizing, government manning trends, etc. After digesting the researched information, a comparison between government and industrial organizations would be made based on the common needs identified earlier in this paper. This comparison would result in certain conclusions which would prove or disprove the hypothesis. Finally, several recommendations and lessons learned would be postulated as a result of the former efforts.

The research and analysis conducted in support of our sponsor organization focused on technical/engineering organizations. Therefore, no effort was made to specifically address the downsizing of an individual organization or propose to recommend ideal levels of support required to attain individual objectives. Additionally, the areas of administrative support and management operations were not targeted for analysis.

Data was gathered from numerous sources including libraries, periodicals, the government printing office, and the Internet. Additionally, some data on manpower was provided by HQ ASC/XR. Both academic and business databases were researched on the Internet. This allowed the team to locate and review previous studies on downsizing and its impacts on organizations. Internet data sources included business school writings (Cornell University, NY State University, Harvard University, Penn State - Wharton School, Stanford University and the University of Colorado), Department of Labor, and the Government Accounting Office, (GAO). A physical periodical search was also conducted targeting the subject of downsizing. A listing of literature found in the team's search is contained in the Bibliography at the end of this paper.

Discussion

Trends Experienced in Industry

In researching literature regarding corporate downsizing and its impacts on organizations, one study, still under final development at the time this paper was written, stood out. Professors Wayne F. Cascio and James R. Morris of the University of Colorado at Denver collected data on over 90 companies in various markets and measured the impacts of downsizing on these companies. While each market was tallied separately, we will only quote the overall averages for the entire group in this paper.

The study was conducted over a 7 year period, during which data on earnings, stock value and sales revenue were collected on all companies. Care was taken to "match" companies within markets. Each company's data was tracked for 3 years prior to a business downturn and three 3 following the downturn, yielding a total analysis period of 7 years. Within each market, when the large downturn in business occurred, some companies opted to significantly downsize their workforce by an average of 31 percent. The remaining companies either downsized slightly or not at all. When the performance of these corporate groups are compared, the results of the 3 years following the "down" year are astounding.

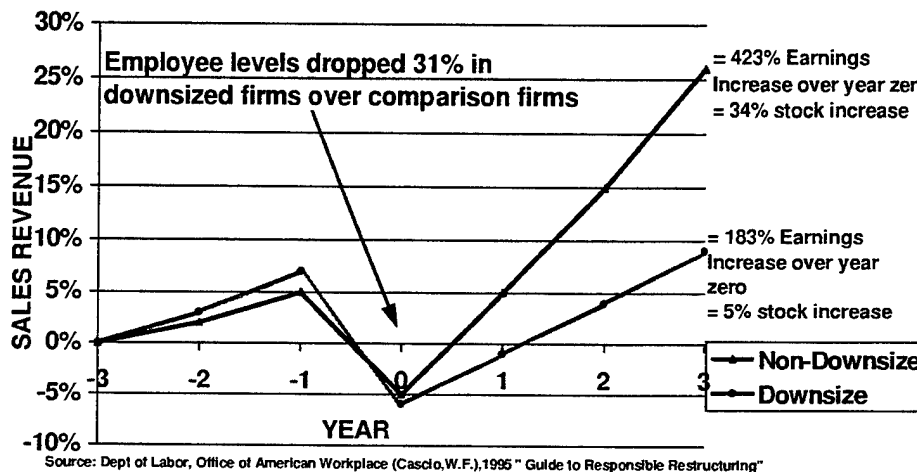
Those companies that downsized significantly were able to recover from their downturn and return to growth. The short-term response from Wall Street to such actions has been resounding support, with stock prices increasing significantly immediately following corporate announcements of intended large scale layoffs.⁴ Overall corporate value likewise improved. On average, from the lowest point to 3 years later, sales revenue increased 13 percent, stock value increased 5 percent and earnings increased 183 percent.⁵ Taken by itself, this data is very impressive. However, as Figure 1 illustrates, when compared to their competitors who did not downsize to the same degree, the results are significantly less alluring.

Not surprisingly those firms that downsized significantly, posted greater sales per employee figures than those firms that did not likewise downsize. This is due to the fact that the rapid reduction of employees exceeded the slope of the curve generated by falling sales that had not yet caught up to the event, thus artificially depicting a favorable picture. Total sales dollars did in fact fall in these companies, while General & Administrative (G&A) costs rose 11 percent on average⁶, thereby further dampening profit potentials and eliminating short-term gains.ⁱⁱⁱ

ⁱⁱⁱ Although definitive data could not be found, it is believed that G&A costs rose in downsized firms disproportionately over those that did not likewise downsize due to several factors. These factors include the costs associated with the actual severance of employees, the indirect costs incurred by the company to administer the layoff actions, including the loss of productivity by diverting assets from their otherwise "productive" tasks, and the inefficient utilization of remaining personnel.

There are also numerous accounts that “after downsizing, many companies experience plummeting employee morale, declining productivity, questionable quality improvement, and a detrimental effect on internal affairs.”⁷

However, companies that downsized only slightly or not at all posted a 32 percent increase in sales revenue over the same lowest year, with a 34 percent increase in stock value and an overall 423 percent increase in earnings!⁸ Therefore, “Three years after the downsizings, average returns on common stock in the industry comparison groups were 7.3 times higher than in the downsizing companies.”⁹



Many large firms have failed competitively following poorly executed downsizing initiatives - Results of a 7 year study

Figure 1

The research yielded several interesting overall effects of downsizing. While an entire paper could easily be developed on each of these areas, it is more appropriate to keep sight of the papers primary objective and summarize overall impacts as succinctly as possible to avoid the temptation of becoming mired in the detail. Therefore, the overall impacts are summarized below:¹⁰

- Firms that did not significantly downsize posted better long-term financial results over those firms that participated in significant downsizing events.
- Downsizing costs can be high, driven by incentives and severance costs.
- Most firms rehired up to 10 percent of those initially let go.
- Over 50 percent of the remaining employees reported increased stress and burnout.
- Organizations were crippled when strategic planning was absent.
- Downsized firms fell behind competitors in the market place.

The reasons for these occurrences are varied, and as will be reflected later in this paper are the result of a myriad of actions and reactions that interplay within the living body of the organization. However, one concept that is often overlooked best summarizes the authors' opinions that explain the potential origin of these results. Specifically, an organizational unit is a compilation of the individuals that form it. Therefore, the importance of individual attitudes and feelings cannot be understated when examining factors that lead to success or failure. Although, large scale cuts taken rapidly may indicate immediate positive results on the balance sheet, this is because the other "side" of the balance sheet has not yet caught up to the event. Elimination of a sales associate will show an immediate reduction in payroll costs; however, the sales made by this employee may still be in the system and not yet delivered, further skewing the numbers in favor of short-term profit. However, when the company works off the sales backlog generated by the laid off employee, the true impact of the action will be felt. Wall Street is a very short-term medium and therefore initially reacts favorably to announced lay offs. However, Wall Street is beginning to take note of various trend indicators that are just beginning to surface. "Companies that had annual growth of more than 15 percent a year from 1989 to 1984 added 1.6 million jobs. Companies that grew less than 5 percent a year cut 2.9 million jobs."¹¹ This explains why companies that downsize do poorly in the long-term, but why then do companies that do not downsize perform so well? Perhaps the answer lies with the emotional state of the individual employees and mind set of management. In an organization that is downsizing, one reverts to the very basic instinct of survivability that in turn drives several nonproductive behavioral patterns. Decisions are based upon individual protection, rather than what may be in the best interests of the overall team or corporation. Second, individual workers remaining become so overburdened, efficiency and productivity drops, and no matter how hard one works they get the feeling of falling further behind, dampening the spirits of even the most positive minded. Forget working a new idea or pursuing a new customer, employees are struggling just to keep up with what they already have to do. Under this scenario receipt of a new order or expanded job assignment is viewed as a burden to be avoided. Management recognizes this and frequently attempts to correct the situation by rehiring laid off employees. "Five companies that laid off large numbers of people the past 3 years expect to hire this year almost one-fifth the number they cut...46,000 people in 1996..."¹² This behavior further negatively impacts bottom lines. Personnel that "toughed it out" at the company are disgruntled and further question management's decision making abilities, and those coming back usually do so at a higher cost to the company. Conversely, companies that do not significantly downsize have the attitude of the need to be progressive and actively seek new opportunities, understanding this is their means to survivability. With resources readily available, new ideas are proactively explored, and new customers sought. The attitude of the individuals and management is fundamentally different and team approaches to problem solving become the norm.

Whatever the postulated reason for the occurrence, the numbers clearly indicate that many large firms have failed competitively in the long-term following poorly executed downsizing initiatives. Given that downsizing will be required at times (and has been

required in the government with Congressional legislation), the question became one of how to downsize effectively to take advantage of the market when it rebounded.^{iv}

Before addressing the issue of how to downsize without crippling technical ability, it is necessary to examine how the functions of a technical organization are distributed with regard to its defined mission.

Technical Resource Distribution Within An Engineering Organization

An organization whose mission is to develop new products, support them during introduction, and continue to provide follow-on engineering support through the products entire life cycle, be they refrigerators or weapon systems, can be divided into four distinct areas. These areas, when layered together, form a Technical Resource Distribution. In other words, within a technical organization each of the four areas is allocated a certain percentage of the total organizational resources. Each of the four areas are explained below.

Existing Systems (Mature Products) - The most critical or basic area performed within a technical organization is the support of existing systems. Existing systems are defined as nonobsolete products that are no longer in production but still in use, or mature products that remain both in use and are still being manufactured. These products form the basis for accomplishment of the "user's" mission. The user can be a consumer in a commercial marketplace or an active force component.

New Product Development - Second in significance is the area of new product development. New products consist of those items which are considered immature with regard to their robustness on the production line or those products still in research, development, or testing. Such products form the basis for progression in the "marketplace." Since no product can last forever, it is very important to have the next generation product underway prior to the current product becoming obsolete. A commercial corporation's failure to adequately respond in this area will have significant adverse effects, and although many corporations may be destined to ultimately fail if they do not correct a deficiency in this area, there is the possibility of recovery.^v However,

^{iv} It should be noted that although the focus of this paper is on downsizing, the research uncovered increasing evidence that the same philosophies can be applied to optimal use of the remaining assets, and growth.

^v During the latter 1970s and early 1980s, Chrysler Corporation significantly trimmed new product introductions to reduce costs and increase the potential for survivability. Upon his assumption of the CEO position, the newly imported Lee Iacocca from Ford Motor Company saw this as a sure road to total corporate failure. He aggressively pursued the development and introduction of new products called the "K" car series. These were cars that had been in development on the drawing boards long before his arrival, but had been shelved to save costs. His only major change to the design was to the front grill assembly that he personally directed to mimic the front grill of a Rolls Royce. The new line was fast tracked into production, and is credited with saving the corporation from ultimate failure.

unlike a corporation, should a country fall significantly behind another in the development of weapons systems, adverse effects from which there may be no recovery will result.^{vi}

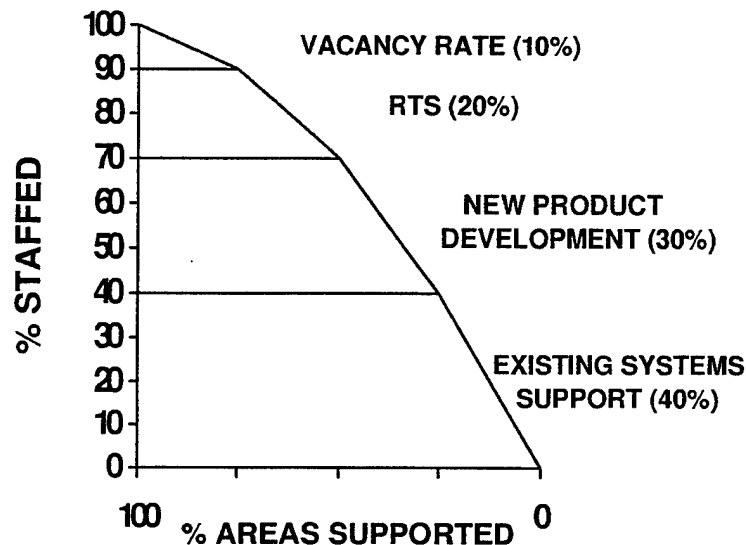
In both of the above areas, Existing Systems and New Product Development, the resources required are typically known and identified during the strategic and tactical organizational planning stages. They are easy to identify, and required support to achieve objectives easily quantified. For example, if an upgrade to an existing product is required, the engineering support required can be reasonably estimated. However, the next two areas are examined and typically fall outside of such planning. They are the most difficult to measure and as a result are thought to be the easiest to cut back.

Readiness To Serve - The third area the organization must fill is Readiness To Serve (RTS), which is defined as technical support that is unbudgeted and unplanned. While such effort was unforeseen, it is usually important and fairly urgent. An organization might suddenly receive a new product requirement based on changing conditions. A recent example in the government was the need to run new tests on existing equipment before deploying to DESERT STORM. No manager could have foreseen this requirement during planning a year prior to the event, yet immediate support is important and required. In addition, the existing planned work is supposed to proceed and finish on schedule. However, in the technical arena "unknowns" frequently surface that demand the use of previously unplanned resources. As in the case of DESERT STORM, or as in an unforeseen engineering change required to keep a products development on track, or a newly surfaced customer need that must be immediately incorporated. For an organization to be successful, it must have the capacity to respond to RTS issues.

Vacancy Rate - The fourth area doesn't seem much like a role at all, but it is an essential element that requires consideration. We call it Vacancy Rate (VR). These are unfilled authorized positions in the organization. They are unfilled because there is constant evolution in an organization - attrition and relocation's being the most common. While this "area" does not take up a lot of the Technical Resource Distribution, it is a necessary and noteworthy portion. It becomes especially critical when in a growth or unplanned response mode - when new requirements are levied and expected to be acted upon quickly. The Vacancy Rate, if properly accounted for, will not hinder an organization's ability to respond to quick reaction needs. Therefore, VR must be considered in staffing and budgeting decisions. Let's assume for example that an organization has a steady 10 percent VR. Now let's assume personnel only allows that organization to staff to the 100 percent level. On the surface this would appear satisfactory; however, when you factor in the VR, 10 percent of the resources required are never available. This places management behind a never ending power curve and constant shuffling to meet demands.

^{vi} During the 1980s it became painfully clear to the United Soviet Socialist Republic that they could not keep pace with the United States in the research, development, and fielding of advanced weapons systems. Their inefficient, bloated system dedicated to development and fielding of such systems was placing an unacceptable burden upon the Russian economy. Faced with the ultimate "guns verses butter" decision, Russia chose "butter," and rapidly ceased being a super power in the world.

A theoretical Technical Resource Distribution is shown in Figure 2. The percentages used in this representation are intended for presentation purposes only, and are not meant to indicate the ideal organization. Different organizations will have unique compositions. The important point is that managers of organizations must recognize the four areas and plan for them accordingly if the organization is to remain healthy and fend off atrophy.



TECHNICAL RESOURCE DISTRIBUTION BY AREA

Figure 2

The distribution may be interpreted as follows. When an organization is fully (100 percent) staffed, then all four areas are covered and supported. However, given the VR discussion above, this may never happen. As staffing is reduced, coverage of the four areas is lost. Typically, the first area to suffer and disappear is VR, followed by RTS, New Product Development and, lastly, Support of Existing Systems. The areas were arranged in this order since experience indicates that reduction of resources yield reduction of support to these organizational areas, in that order. Of course, an argument can be made as to the over simplicity of the diagram, but it is sufficient to make the point. To use an example of reading the graph, if staffing were reduced by 20 percent (the point on the curve where the Staffing axis reads 80 percent), there would likely be no vacancies remaining in the organization and RTS effort or availability would be reduced by half (from 20 percent to 10 percent of the total organizational availability). Again, the purpose of this discussion is to convey the concept. In a global sense this is what is occurring within technical organizations and without a clear understanding of these concepts, the day to day world of downsizing can be increasingly challenging to effectively manage. Specifically, if a manager does not grasp these “areas” they may lose sight of how to best communicate with management. For example, senior management may force reductions upon an engineering organization that is barely meeting existing demands. In this case, the

engineering manager may agree to the cuts with the clear understanding that one or more of the service areas will be affected. For example, engineering management may indicate it will be required to eliminate RTS and have every intention of sticking to it. Further, senior level management when faced with this as the only reasonable option may express understanding and concurrence. Unfortunately, senior management tends to have a short memory, and is soon thereafter expecting attention be paid to pop-up demands. Therefore, more often than not, the remaining organizational resources will attempt to continue to serve all areas, usually pushing out projects with the longest lead times, building a tidal wave, that left unchecked will ultimately yield catastrophic failure.

Methods of Downsizing

The stark reality is that budgets will be cut, and that organizations are living entities that must continually change and evolve to remain optimally staffed to meet ever changing customer demands. There are times to both increase and decrease staffing levels within any technical organization. The question therefore becomes how to best implement these changes when needed.^{vii} When downsizing becomes a necessity, organizations approach it using different methods. We have identified four basic methods used alone or in combination to achieve technical staff reductions. Table 1 summarizes the methods and their pros and cons.

Peanut Butter Spread - This method is defined as equally reducing areas across-the-board to meet an overall reduction goal, that is usually conveyed by the financial community as a percentage of payroll, or in some cases personnel. In other words, the reductions are spread evenly across the entire organization, like peanut butter is spread on a piece of bread. On the plus side, this is an easily understood concept, it is easy to implement, and seems to have an apparent "fairness" in that everyone suffers equally. In reality, it causes disproportionate and arbitrary losses, and after several rounds can eventually reduce all areas to the point where nothing is being satisfactorily accomplished.

Area Elimination - This is the approach of eliminating technical services by area, usually beginning with VR followed by RTS, followed by New Product Support. Again, this is a concept that is easily understood and implemented. The organization simply won't be able to accept unplanned taskings because of the elimination of resources to support RTS for example. Management will also usually state their acceptance of the loss of support in the reduced/eliminated area(s). However, as mentioned earlier, most

^{vii} Although not the primary focus of this paper, planning in advance of the event is essential. The more effective and timely the advance planning process, the better an organization can prepare for any eventuality. As will continue to be evidenced in this paper, unplanned arbitrary knee-jerk reactions to resource decisions, while seemingly beneficial in the short-term, yield undesirable long term results.

Table 1 *COMPARING DOWNSIZING METHODS*

Method	Pros	Cons
Peanut Butter Spread	<ul style="list-style-type: none"> - Concept easily understood and conveyed - Ease of implementation - Apparent "fairness" 	<ul style="list-style-type: none"> - Disproportionate & arbitrary spreading of losses - Eventually all areas reduced to point where nothing is being satisfactorily accomplished
Area Elimination	<ul style="list-style-type: none"> - Concept easily understood and conveyed - Ease of implementation - Management's stated acceptance of area support loss 	<ul style="list-style-type: none"> - Management still demands support of ALL areas - Increased individual stress and burnout - Single personnel loss yields immediate adverse impact
Product Elimination	<ul style="list-style-type: none"> - Easily defined area of focus - Easy to communicate management desires - Up front acceptance of market share loss and associated financial impacts 	<ul style="list-style-type: none"> - High risk - Difficult to handle "multi-use" personnel - Strands users with obsolete and unsupported product - Difficult to re-enter an abandoned market
Functional Tailoring	<ul style="list-style-type: none"> - Detailed methodical approach based on customer needs - Highlights internal/external strengths and weaknesses - Optimize personnel by matching to needs 	<ul style="list-style-type: none"> - Time consuming and labor intensive - Requires total objectivity - Process easily usurped by singular agendas

experienced managers will testify that senior level of management almost always will continue to demand support of ALL areas, in spite of previous acknowledgments. By having to continue to cover all areas with less resources, the individuals remaining demonstrate increased individual stress and burnout.¹³ Organizations are often reduced to the point of being "one deep." Therefore, the loss of a single individual, even if only temporarily for vacation or training yields an immediate adverse impact on the capability of the organization. This highlights another subtle cancer on the organization during this period. Specifically, supervisors and managers become increasingly less supportive of actions that would temporarily remove an individual from their primary task. Reduction in training for example, further reduces an organization's effectiveness.

Product Elimination - Managers can decide to eliminate individual product lines, thus preserving their total range of technical services for the remaining products. This action has an easily defined area of focus, is easy to communicate, and forces management to accept the market share loss, and associated financial impacts up front. However, this is a high-risk approach as success depends upon fewer products. Users are stranded with suddenly obsolete and unsupported products. "Multi-use" personnel are difficult to re-assign in this case also. Finally, should the decision be reversed, it is very difficult to re-enter an abandoned market. As discussed earlier, it is particularly difficult for this course of action to be pursued in the defense sector. Unlike a commercial corporation, decisions of this nature in the government are not under the authority of a single individual, or even a single organization. Further, these diverse organizations are seldom linked in a way that promotes expeditious decision making. Another related factor to consider, under this area, is even what would appear to be a dramatic reduction in a single weapons system may not yield a commensurate reduction in the technical resources required to support the reduced number remaining. For example, the engineering sustainability resources required to support a single squadron of B-52 bombers, may be virtually the same required to support several squadrons/wings. Therefore, true benefit is not realized by the technical support team until all B-52s are retired from service. However, to fully retire this aircraft, an adequate number of newer replacement aircraft is required. To preserve national defense, there must be an overlap period when for some time interval both systems are operational. As Congress controls the funds required to purchase replacement aircraft, and the amount fluctuates, sometimes yearly, the services often find themselves in the position of having to support both systems beyond previously scheduled retirement dates of the old systems due to introduction push outs of the emerging systems. Add to this, unforeseen slippage's that result from not keeping up with the engineering load as expressed under RTS and one can begin to see the origin of inefficiencies and "surprises." The "bridge" period between retirement of the old and introduction of the new often extends far beyond what would be deemed prudent in the commercial sector.

Functional Tailoring - This method tailors reductions based upon results of an organizational analysis that is founded upon a strategic plan structured to meet customer requirements. It receives high marks because it involves a detailed, methodical approach, highlights internal and external strengths while considering weaknesses, and optimizes personnel utilization by matching skills to ensure optimal satisfaction of identified

customer needs. The trouble here is that it is time consuming and labor intensive, requires total objectivity, must be accomplished with total senior management buy-in, and is a process easily usurped by singular agendas.

Comparison of Common Practices

It is evident from studying the results of different approaches of reduction in the commercial sector that there are effective and ineffective methods of downsizing. To illustrate, we have compared industry to government in the practice of directing percentage of cuts from the upper most management levels.

The most common practice shared between industry and the government is the directed reduction of personnel mandated from the "top" as a percentage. While this practice is common, its timing, measurability and accountability is very different between the two organizations. The timing of industry reductions is usually a single annual event, whereas the government reductions occur as multiple events annually by Major Force Program. In a corporation, a business unit manager is directly responsible and accountable for the reduction and its effects. In the government, responsibility for reductions is not clearly defined below the Air Staff level due to multiple "ownership" interests. The impacts of corporate reductions can be measured in market share, sales revenue, and profitability. Because the success criteria of the multiple owners in the government are not complementary, it is virtually impossible to measure the success or failure of reductions in a way that is equivalent to the industry measures.

In order to meaningfully use industry lessons learned in downsizing for government atrophy issues, those lessons must be translated. As illustrated above, there is no direct comparison of market share or profitability to the government sector. So it becomes necessary to identify what is effective in industry, then transport the methods to government where applicable. Judging the effectiveness of those methods on the government organizations will be more subjective, involving questions such as "Has the organization been able to continue supporting identified and unplanned requirements without burning out employees?" With this in mind, the remainder of this paper identifies and targets current government practices that are not working, then recommends methods that will work if adopted and executed properly.

Current Flawed Government Practices

Loss of Vacant Positions - The first and most obvious flawed practice used by the government in downsizing organizations is the use of the Peanut Butter Spread method causing the loss of vacant positions. This arbitrary loss of vacant positions, some of which are vitally necessary to the organization, reduces the ability of the organization to meet

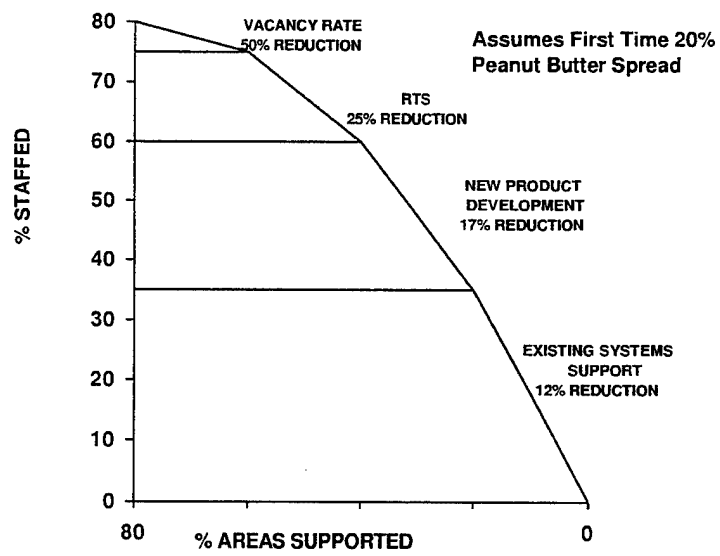
mission requirements. Instead of analyzing the need for a position, whether it be vacant or not, a vacant position is almost always the first thing to go in reductions. As a result, the organization may be manned by the proper numbers of personnel, but the criticality of those positions and their impact on the organization's effectiveness is forgotten. This also highlights the lack of comprehensive strategic planning. The government is not alone; this lesson is being learned in the commercial sector where "corporate cutting" has also been indiscriminate. Typically, companies implement across-the-board reductions before process improvements have been thoroughly studied, much less implemented."¹⁴

Personnel Actions - Anxious to reduce the force in as nonconfrontational manner as possible, it has become a popular practice to offer early-out incentives to senior personnel. In addition, hiring freezes are enacted on entry-level positions.¹⁵ This less painful fix actually puts managers at the head of a greatly imbalanced organization. The combination of these actions create a disproportionate bulge in the mid-year experience group. This causes a double problem: on the one hand there aren't enough people with experience to handle the senior level tasks effectively, while on the other hand you have over-experienced personnel handling tasks that would normally be handled by entry-level employees. End result: not only is the organization operating with fewer people, but those people who remain are being used very ineffectively. The organization is investing too heavily in the learning curve for senior level tasks, and is paying too much for accomplishment of lower level tasks.^{viii 16}

Reduced Support - In too many organizations, the peanut butter spread has been used repeatedly, leading to an organization with relatively few people trying to "cover all the bases." This is a diminishing returns example, where no needs are satisfactorily met. As one task is started, another interrupts. This continues and nothing really gets done in an effective or complete manner. Incomplete or shoddy work is inevitable in this situation. Eventually, this is noticed and reflects poorly on the organization and individual, which in turn lowers morale and strips motivation from the employees. This tends to be a downward spiral which is very difficult to reverse, often necessitating disbanding the organization and starting over again - an expensive and time consuming proposition at best.

Using the previously introduced Technical Resource Distribution model, the effect of a first time 20 percent Peanut Butter Spread reduction is illustrated in Figure 3. As noted on the figure, not all of the 20 percent comes off the top two areas. A typical case would reduce the VR by 50 percent, RTS by 25 percent, New Product Development by 17 percent and Existing Systems Support by 12 percent. As the Peanut Butter Spread technique is applied again, the effects become much more pronounced and the organization is quickly brought to its knees.

^{viii} As stated in the referenced GAO report; "DoD's basic strategy of relying on voluntary attrition and hiring freezes to meet civilian reduction targets has made it difficult for Defense activities to plan downsizing in an orderly manner, and to achieve reductions where and when they are most needed. This approach has adversely affected the operations of Defense organizations by producing skill imbalances, and has produced an increasingly more senior and relatively more costly work force."



IMPACT OF CURRENT GOV'T PRACTICE

Figure 3

Recommendations

In summary, there is ample evidence of how poorly executed downsizing can adversely impact an organization, be it a corporate or government entity. There is recent evidence that the bloom is off the corporate ax, as long-term results begin rolling in. Well constructed strategic planning is enjoying a resurgence, with increased emphasis on the customer. "After a decade of shrinking to hike productivity and efficiency, companies are now eager to wring more profits out of those streamlined operations. So what's making a comeback? You guessed it: strategic planning."¹⁷ However, should downsizing be required, there is evidence of successful methods to employ.

Poorly executed or arbitrary downsizing is a major contributor to industry failure. Methods such as the Peanut Butter Spread, if used repeatedly, doom an organization to failure. In a government organization, this failure becomes apparent when an organization is paralyzed because the proper people are not in place to effectively accomplish the mission. Unless better strategies are used, this trend will continue. Instead of doing more with less, even less will be done with less. The notion of doing more with less is successful only when the "less" is truly accepted by both the customer and senior management, and needed personnel resources are properly qualified and positioned. In other words, an organization properly tuned. This can be accomplished through the application of "Functional Tailoring." Functional Tailoring is more of a concept than a formalized process. Unlike the strategic planning of 2 decades ago that was top down directed and reserved for the corporate elite where markets were "created" and controlled, current strategic planning is based upon gaining a clear understanding of customer needs. Once this is understood, all corporate resources are energized through teaming efforts to establish courses of action necessary to best meet those needs.¹⁸

Although many problems have surfaced during the process of downsizing, the need to continually re-evaluate and adjust organizations is a reality. This mandates an approach which offers the best possibility of succeeding when faced with a reduction or downsizing initiative. The primary recommendation for successfully evaluating and shaping an organization is to accomplish Functional Tailoring to properly meet *both* reduction and re-staffing initiatives. It may even be effective to make use of any one or combination of the four reduction methods defined in this paper; however, any reduction must be based on the principle of functional tailoring. This will mean that managers at all levels, especially senior levels, will need to commit to the investment of time necessary to properly define the shape of an organization based upon customer needs and the availability of corresponding resources.^{ix} This shape will therefore be dictated by the strategic plan, developed to best meet the customer's (user's) needs.

^{ix} "J.M. Smucker Co., the Ohio based maker of jams and jellies,...recently enlisted a team of 140 employees - 7% of its workforce - who devoted nearly 50% of their time to a major strategy exercise for more than 6 months." Source: John A. Byrne, *Strategic Planning*, BusinessWeek, August 26, 1996, pp 46-52

Successful Functional Tailoring

The process of Functional Tailoring to better shape an organization is one that involves a commitment to rethink the organization's approach to business as usual. The following outlines the steps needed to successfully negotiate the tailoring process.

- 1) Clearly understand true customer's needs and the customer's criteria by which they measure satisfaction of those needs.
- 2) Clearly understand internal criteria for success, and how to measure attainment.
- 3) Plan strategically to meet customer needs. If you don't have a strategic plan, develop one. Know where the organization's goals lay in a global sense. That way, the detailed plans will complement the strategic objectives. You will initially need to involve your superiors with regard to the long-range objectives. Once you know what the major objectives are, you're ready to plan how you will get there most effectively. Most importantly, employees from all levels must be actively involved in the process. They are a wealth of knowledge and experience, and will feel more of a commitment to the objectives if they are involved from the start. Not to mention the fact that they may have the best solutions. The most import rule is to Communicate - Communicate - Communicate.
- 4) Shape the organization to the strategic plan. Look to optimize functions to exploit strengths and minimize internal weaknesses. (Yes, this will also involve identifying employees who will require retraining, repositioning, or even terminated.) Don't let tradition bog you down - just do what needs doing and discard the superfluous. Don't forget to involve your employees and Communicate - Communicate - Communicate.
- 5) Few, if any, plans are perfect the first time around. Know this and develop feedback loops and metrics to measure success in meeting customer and internal requirements. Follow up with course corrections once you begin down the newly conceived path.
- 6) As things start settling down with the new direction, don't forget to reward your remaining employees and keep the communication lines open in both directions. Your customers are likewise being rewarded by your provision of more cost effective goods and services.

Within the government, there are hurdles which make this process difficult but not unattainable. We are an organization tangled in many regulations and rules, subject to many masters. However, it is the author's belief that better organizations can be shaped, even under current guidelines. It may not be the easiest path, but it will be worth it as we witness employees morale rise and more mission requirements being met satisfactorily, while simultaneously insuring optimal use of tax payer resources.

References

- ¹ Casio & Morris, *The Impact of Downsizing on the Financial Performance of Firms-Working Paper*, University of Colorado at Denver, p. 3.
- ² Underwood, McCormick & Branscombe, *The Hit Men*, Newsweek Magazine, February 26, 1996, pp. 44-48. This article examines various corporate CEOs and the thousands of personnel they have laid off over a short period of time. Wall Street's response has been resounding support, with stock prices increasing significantly immediately following corporate announcements of intended large scale layoffs. However, as will be demonstrated by the research of Casio & Morris and others, this is a short term gain, the attractiveness of which will fade over time.
- ³ Griffin, SES, Director Development Planning Directorate, Aeronautical Systems Center (ASC/XR), Air Force Material Command, United States Air Force.
- ⁴ Underwood, McCormick & Branscombe, *The Hit Men*, Newsweek Magazine, February 26, 1996, pp. 44-48.
- ⁵ Casio & Morris, *The Impact of Downsizing on the Financial Performance of Firms-Working Paper*, University of Colorado at Denver.
- ⁶ Ibid.
- ⁷ Baggerman, "The Futility of Downsizing," Industry Week, January 18, 1993, p27.
- ⁸ Ibid.
- ⁹ Casio & Morris, *The Impact of Downsizing on the Financial Performance of Firms-Working Paper*, University of Colorado at Denver, p. 2.
- ¹⁰ Ibid.
- ¹¹ Mary Motta, *Growth Takes Over Corporate Focus*, USA TODAY, June 5, 1996, Money section. Data provided references research performed by Thomas Doorley, a partner at Braxton Associates, the global strategy arm of Deloitte.
- ¹² Staff Writer, *Downsized Firms Hiring*, USA TODAY, May 29, 1996, Money section. The article cites "a Challenger Gray & Christmas survey, Sears, IBM, AT&T, Boeing and Xerox announced a total of 249,836 layoffs since 1993. The outplacement firm says the companies expect to hire 46,000 people in 1996, or 18% of the number they laid off."
- ¹³ Casio & Morris, *The Impact of Downsizing on the Financial Performance of Firms-Working Paper*, University of Colorado at Denver.
- ¹⁴ Shoop, T., *Exodus*, Government Executive, June 1994, p.7.
- ¹⁵ Blum, J.L., Testimony on Voluntary Separation Incentives before the subcommittee on Civil Service Committee no Government Reform and Oversight, U.S., House of Representatives, May 17, 1995. "The DoD has relied primarily on hiring freezes in the substantial downsizing of its civilian workforce.
- ¹⁶ GAO Report, "Defense Civilian Downsizing - Challenges Remain Even With Availability of Financial Separation Incentives," GAO/NSIAD-93-194, May 14, 1993.

¹⁷ John A. Byrne, *Strategic Planning*, BusinessWeek, August 26, 1996, pp 46-52.

¹⁸ Ibid.

Bibliography

- Baggerman, *The Futility of Downsizing*, Industry Week, January 18, 1993
- Blum, J.L., Testimony on Voluntary Separation Incentives before the subcommittee on Civil Service Committee on Government Reform and Oversight, U.S. House of Representatives, May 17, 1995
- Byrne, John A., *Strategic Planning*, BusinessWeek, August 26, 1996
- Casio & Morris, *The Impact of Downsizing on the Financial Performance of Firms-Working Paper*, University of Colorado at Denver
- Cuirle, W.F., *Finding Future Managers: Cutting Through the Hiring Freeze*, ComputerWorld, March 31, 1986
- Dichter, M., and Trank, M.A., *Learning to Manage Reductions in Force*, Management Review, March 1991
- Ettore, B. and McNerney, D.J., *Human Resources: Managing Human Capital for the Future*, Management Review, June 1995
- Faltermayer, E., *Is This Layoff Necessary?*, Fortune, June 1, 1992
- Government Accounting Office, *Defense Civilian Downsizing - Challenges Remain Even With the Availability of Financial Separation Incentives*, GAO/NSIAD-93-194, May 14 1993
- Government Accounting Office, *Workforce Reductions: Downsizing Strategies Used in Selected Organizations*, Chapter Report, GAO/GGD-95-54, March 13, 1995
- Heenan, D.A., *The Downside of Downsizing*, The Journal of Business Strategy, November/December 1989
- Henderson, B., *Laying Off Workers no Quick Cure for Company Ills*, Kansas City Business Journal, September 17, 1993
- Holliman, S.D., *Civilian Personnel Employment Levels, Separations, Transition Programs and Downsizing Strategy*, Annex K to *Adjusting to the Drawdown*, Report of the Defense Conversion Commission, February 1993
- Hornestay, D., *No Way Out*, Government Executive, March 1995
- Kingsbury, N., *Testimony on Status of Workforce Reductions Mandated by the Federal Workforce Restructuring Act of 1994*, Civil Service Committee of the House, Government Reform and Oversight Committee, March 2, 1995
- Lesly, E. and Light, L., *When Layoffs Alone Don't Turn the Tide*, BusinessWeek, December 7, 1992
- Miller, W.H., *Fizzle of a Fad Fix*, Industry Week, February 1, 1988
- Morley, M.P. and Doyle, F.P., *Corporate Restructuring and Downsizing*, Hearing before the committee on the Budget, House of Representatives, Serial No. 104-10, March 23, 1995
- Motta, Mary, *Growth Takes Over Corporate Focus*, USA TODAY, June 5, 1996
- Pang, F.Y., *Testimony on Manpower, Personnel and Compensation Programs of the Department of Defense*, Subcommittee on Personnel of the Committee on Armed Services, U.S. Senate, March 16, 1995
- Pelline, J. and Howe, K., *Downsizing the U.S. Workforce*, The San Francisco Chronicle, October 26, 1992

Shoop, T., *Exodus*, Government Executive, June 1994
Staff Writer, *Downsized Firms Hiring*, USA TODAY, May 29, 1996
Underwood, McCormick & Branscombe, *The Hit Men*, Newsweek Magazine,
February 26, 1996
Zlatoper, R., *Testimony on the Navy's Manpower Programs*, Defense
Subcommittee of the Senate Appropriations Committee on Manpower and Personnel
Issues, April 19, 1994